Amendments to and Listing of the Claims:

Please amend claims 1, 2, 5, 7, and 8 so that the claims read as follows:

1.   (currently amended) A method for measuring a concentration of water in argon, hydrogen, nitrogen ~~and~~or helium by ionization mobility spectrometry (IMS), comprising the followings operative steps:

introducing a gas mixture to be analyzed <u>comprising water and at least one selected from the group consisting of argon, hydrogen, nitrogen, and helium</u> into an IMS instrument ~~(10)~~ with a counter-flow of pure gas;

obtaining a signal ~~(19)~~ variable over time and proportional to a number of ions detected by an ion detector ~~(14)~~ of the IMS instrument ~~(10)~~;

determining two time intervals (A, B) corresponding to drift times in the IMS instrument ~~(10)~~ of H_3O^+ and $(H_2O)_2^+$ ions present in the gas mixture;

obtaining peaks of the signal ~~(19)~~ in the two determined time intervals (A, B); and calculating the water concentration in the gas mixture according to a ratio of intensity of the two peaks obtained in the signal ~~(19)~~.

2.   (currently amended) The method according to claim 1, wherein the water concentration in the analyzed gas is calculated by the following formula:

$ppb_{H2O} = K \ln((HB + HA) / HA)$, wherein:

ppb_{H2O} is the water concentration in ppb,

K is a positive constant,

HA is the intensity of the peak of the signal ~~(19)~~ in the time interval (A) corresponding to the drift times of H_3O^+ ions in the IMS instrument ~~(10)~~; and

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HB is the intensity of the peak of the signal (19) in the time interval (B)

corresponding to the drift times of $(H_2O)_2^+$ ions in the IMS instrument (10).

3. (previously presented) The method according to claim 2, wherein areas of the

peaks are employed as measures of the intensity of the respective peaks.

4. (previously presented) The method according to claim 2, wherein heights of the

peaks are employed as measures of the intensity of the respective peaks.

5. (currently amended) The method according to claim 1, wherein the two time

intervals (A, B) corresponding to the drift times of the H_3O^+ and $(H_2O)_2^+$ ions in the IMS

instrument (10) are determined with a preliminary calibrating test carried out with values of

operative parameters equal to those employed in an actual analysis.

6. (previously presented) The method according to claim 5, wherein the operative

parameters comprise at least a temperature of the analyzed gas mixture.

7. (currently amended) The method according to claim 6, wherein the operative

parameters further comprise a ratio between an applied electric field and a gas pressure in a

separation zone (12) of the IMS instrument (10) .

8. (currently amended) The method according to claim 5, wherein the analysis is

carried out with gases at a temperature of 110 °C and with an electric field of 128 V/cm in a

separation zone (12) of the IMS instrument (10), and the two time intervals (A, B) corresponding

to the drift times of the H_3O^+ and $(H_2O)_2^+$ ions in the IMS instrument (10) are between 15.5 and

17 ms (A) and between 17 and 19 ms (B).